Return on Assets Loss from Situational and Contingency Misfits

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We develop a rule-based contingency misfit model and related hypotheses to test empirically the Burton and Obel (1998) multicontingency model for strategic organizational design. The model is a set of “if-then” misfit rules, in which misfits lead to a loss in performance; they are complements to the strategy and organizational contingency theory fit rules. Using data from 224 small- and medium-sized Danish firms, misfits are categorized and identified. Then, performance hypotheses are developed and tested using regression models. We confirm the hypotheses that firms with situational misfits or contingency misfits, or both, incur performance losses in return on assets compared with firms with no misfits. Contrary to our hypotheses, we did not find that additional misfits lead to increased performance loss. Our results suggest that just one misfit of any kind may significantly compromise performance. These results yield a deeper understanding of organizational contingency theory, as well as implications for the rule-based fit-misfit organizational design model.

(Misfit; Contingency Theory; Organizational Design; Complexity Theory; Strategy Implementation)

Introduction

This paper tests the multicontingency fit model for strategic organizational design (Burton and Obel 1998), which builds on Miles and Snow’s (1978) strategic-fit model; Mintzberg’s (1979) structuring model; Galbraith’s (1973, 1995) star model; Nadler and Tushman’s (1984) congruence model; Miller’s (1987) environment, strategy, and structure model; and Meyer et al.’s (1993) configurational model, among others. There is a vast literature that tests alignment and fit relations for a few relations, whereas this model is a more comprehensive model involving many relations. We develop complementary misfit hypotheses for the design-fit model, in which a misfit is an organizational misalignment that diminishes performance (Donaldson 2001, Gresov 1989, Nadler and Tushman 1984, Naman and Slevin 1993). The misfit hypotheses are supported from complementary-fit statements and a misfit rationale.

We investigate the hypotheses that firms with either one or both situational and contingency misfits suffer a performance loss, compared with firms without any misfits. Furthermore, we investigate if firms with fewer misfits have a lower performance loss than firms with many misfits.

We first review the basic notions of fit and misfit within the contingency model of organizational theory. Then, we present our multidimensional contingency model and discuss fit and misfit. Additionally, we extend the multidimensional contingency model to include management style and organizational climate, as well as more traditional structural variables. Next, hypotheses are developed that relate misfits to performance. We test the hypotheses using data from 224 Danish small- and medium-sized production and service enterprises (SMEs). We then discuss the implications for the rule-based organizational design model.
Background Literature
The development of the contingency model for organizational design rests on the assumption that a fit among the “patterns of relevant contextual, structural, and strategic factors” will yield better performance than will a misfit (Doty et al. 1993, p. 1196). Early arguments in contingency theory used the complementary of fit and misfit as evidence and support of the contingency propositions. Burns and Stalker (1961) found that a firm with a high uncertainty environment performs better with an organic structure—an environment-structure proposition (i.e., a misfit occurs when a high uncertainty environment occurs with a mechanical structure). Lawrence and Lorsch (1967) developed the “environment-structure” fit proposition in their study of the plastics, food products, and container industry firms. Thompson (1967) argued that high uncertainty in the environment could and should be buffered from the technical core. Furthermore, his matching of technology types (sequential, parallel, and reciprocal; with structures, functional, divisional, and matrix) was supported by fit arguments. Woodward (1965) observed that the type of technology determined the organizational characteristics in successful firms—a technology-structure proposition. Fry (1982) showed that deviations from the fit/norms decrease performance.

Gresov (1989), in his empirical study of the work units in employment-security offices, measured explicitly both fit and misfit conditions to test propositions on context design and performance. He found strong support for the context design proposition that an organic design is a fit with an uncertain environment, but mixed support that performance decreases from misfits. His results are consistent with equifinality in that functionality is the performance requirement, not the structure per se (Gresov and Drazin 1997). That is, different structures in a given circumstance can yield performance sufficient for viability, although not necessarily optimal. Naman and Slevin (1993) devised and tested a normative fit model of entrepreneurship. They modeled fit among the entrepreneurial, organicity and mission strategy, and operationalized fit by a misfit measure of the sum of the absolute differences between desired levels and observed levels of entrepreneurship, organicity, and strategy. Using senior executives as respondents from 82 manufacturing firms, they tested the model and found that fit was positively related to performance or that “fit matters.” They called for additional studies on the synergy of fit. In their empirical study of savings and loan organizations under crisis, Zajac et al. (2000) tested a normative, dynamic multicontingency strategy fit/misfit model, which includes structural fit. That is, the environment, structure, and strategy should fit for better performance. Here, a strategic misfit is realized when needed strategic change is excessive or insufficient. Studying Savings and Loan (S&L) institutions, they found support for a number of contingency hypotheses, specifically, “the greater a S&L’s deviation for the contingency model of change, the worse the performance” (p. 444). They identified normative implications and how a firm should change when the environment and structure create a misfit with the strategy. Thus, the understanding of interactions or fit among firm activities is important.

Multicontingency theory and configurational theory extend the bivariate concepts of contingency theory to multiple dimensions. In his review article on configuration theory, Miller (1987) listed four elements of configuration: Leadership, environment, strategy, and structure. A viable configuration is then a combination of these elements, which fit together into gestalts and yield good performance. Mintzberg (1979) introduced a more integrated view of contingency notions and proposed a multiple contingency model, which suggested that size, technology, environment, and management would affect the choice of an appropriate structure for the firm. He suggested that a small number of the possible configurations would be reasonable, although not necessarily optimal—an equifinality argument, and he did not exclude other configurations as reasonable. Miles and Snow (1978) argued that the configuration of environment, strategy, and organizational structure should fit together, and implicitly that other combinations of these three elements would not perform as well or be misfits. In their empirical study, Doty et al. (1993) found support for the Miles and Snow configurations, but not for the Mintzberg configurations. They also found support for the equifinality proposition. Meyer et al. (1993) developed a configurational model that
incorporates multiple variables, which they find very promising.

Building on these models, Burton and Obel (1998) devised an expert system that captures the knowledge of multicontingency theory for application in organizational design. The model is shown in Figure 1. The multidimensional contingency approach relates organizational size, climate, strategy, technology, environment, and management style to organizational structure and design to ensure an efficient, effective, and viable organization. It is a systems model, which incorporates a simultaneous multidimensional concept of fit as discussed by Drazin and Van de Ven (1985). The basis for the model is an information-processing perspective (Nadler and Tushman 1988), in which the organization is designed so that the information-processing demands are aligned with the information-processing capacity of the organization (Arrow 1974, Galbraith 1973, 1974, 1995). Compared with traditional contingency and configurational models, the model in Figure 1 includes organizational climate and managerial style.

In the development of a multicontingency normative theory of organizational design, Baligh et al. (1996) and Burton and Obel (1998) utilized both fit and misfit notions. Misfit and fit are complementary concepts; each implicitly implies the other. Following Burton and Obel (1998), fit can be categorized in terms of situational and contingency fit (p. 15). The situational fit involves the balance of the environmental conditions, the strategy, the management style, the climate, the size, and the technology. The research in strategy, management, climate, and technology provides the basis for situational fit, in which organizational contingency theory provides the support for the contingency fit rules. The multicontingency of environment, technology, size, strategy, climate, and management style requires a fit of these factors with the characteristics of the organization, such as its level of decentralization, formalization, etc. Contin-
gency fit is a match “between the organization structure and contingency factors that has a positive effect on performance” (Donaldson 2001, pp. 7–10). Donaldson indicates that “while a misfit produces a negative effect on organizational performance, structural change to a fitting structure is not usually immediate” (p. 15). He discusses misfit as a condition that calls for the organization to move back to fit (p. 165). Fit recommendations are triggered by misfit observations. For example, a fit recommendation that the organization should be decentralized is operative only if it is not currently decentralized. Fit recommendations are “should be” statements; misfit statements are “should not be.” Other terms have been used for misfit: Deviation, misalignment, incongruence, out of kilter, incompatibility, gap, and so on.

The fit-misfit concepts are fundamental in design. Alexander (1964), an architect, focuses on the design process, “the process of achieving good fit between two entities as a negative process of neutralizing the incongruities, or irritants, or forces, which cause misfit...though equivalent from a logical point of view, from a phenomenological and practical point of view, they (fit and misfit) are different” (p. 24). He states the design problem, “the form is the solution to the problem; the context defines the problem” (p. 15) and further, “The form is a part of the world over which we have control, and which we decide to shape while leaving the rest of the world as it is. . . . Fitness is a relation of mutual acceptability between these two” (p. 19).

In discussing external versus internal fit, Miller (1992) argued that it may be difficult to obtain concurrently the different kinds of fit, and a sequential approach may be needed to obtain total design fit. This may include “periodically disrupting the harmony” to adjust to changes in the situation while more generally “striving for harmonious alignment.” Misfits are misalignments, deviations, out-of-kilter situations, gaps, and undesired properties that need to be fixed. Misfits provide a managerial view of organizational design for a number of reasons. First, deviations from fit are easier to identify and measure than are conditions of fit. Second, misfits are managerial in orientation; managers react to misfits because they have performance implications. Third, misfits come in smaller sets than do fit conditions. With equifinality, there is a very large number of fit conditions for a given organization, which yield reasonable performance outcomes. Therefore, it is both empirically and managerially convenient to focus on misfits. Based on the model depicted in Figure 1, we will next develop a set of extreme misfits that form the basis for our empirical analysis. We will develop the set of extreme misfit from both misfit statements and arguments and as complements to fit statements. For example, a fit statement that a routine technology fits with a defender strategy is a complement statement to the statement that a routine technology is not a good choice for a prospector strategy. Extreme misfit is a condition for which we have information that it will decrease performance consistent with the misfit definition. In our analysis that follows, we focus on extreme misfit statements using the Burton and Obel (1998) framework and model. For each extreme misfit proposition in our empirical model, we find support from previous studies and arguments from the information-processing models for organizational design. We then develop a model to test if the set of misfits has the expected performance implications.

Extreme Misfit Hypotheses
Extreme misfits are misfits; but not all misfits are extreme. Extreme misfits are those misfits for which we can make a theoretical argument and have empirical evidence that they affect performance significantly. For example, a highly routine technology is an extreme misfit with an equivocal environment, whereas a medium routine technology may be a misfit with an equivocal environment, but not an extreme one. Of the possible misfits, the extreme misfits are a small number. However, the extreme misfits are a large number when compared with the usual empirical test that examines very few fit or misfit propositions.

We develop the extreme misfits categorized by situational misfits and contingency misfits, and give the rationale for those propositions. The extreme misfits are either taken directly from or are based on fit statements from the multidimensional contingency model (Burton and Obel 1998). The support for the statements will be given both with reference to Burton and
Obel and usually with at least one additional source. In the literature, there is more support for these statements. For example, the Miles and Snow (1978) strategy typology has been studied, tested, and supported in several hundred studies.

**Situational Misfits**

Situational misfits are performance diminishing situations among (between) situational factors in the multi-contingency model shown in Figure 1. In that model, there should be a congruency and balance between the situational factors. For example, a highly uncertain environment fits with a prospector strategy, but is a misfit with a defender strategy; the defender cannot make the needed adjustments to changes in the environment as they occur.

We include 24 extreme bivariate situational misfit statements. They are a subset of the 48 misfit statements from Burton and Obel (1998) that can be categorized as extreme. We have grouped the misfit statements into subsets on one situational factor and then discuss them together. Together, these misfit statements yield our hypotheses that (1) a situational misfit is costly to the organization, and (2) more misfits are more costly. The actual operationalization of the concepts as they are used in this study is given in the Appendix.

**Environment-Strategy.** The first group of misfits, ES1 . . . ES5, deals with environment and strategy relationships. The general proposition is that the environment influences what are viable strategies for the firm. For example, a highly uncertain environment calls for a strategy that adapts to the environment in a timely manner. These relations have been well studied (Miles and Snow 1978, Porter 1985, Venkatraman and Prescott 1990). For this study, the environment has three dimensions: Complexity, uncertainty, and equivocality (Burton and Obel 1998, pp. 176–178). Complexity is the number of variables in the environment; uncertainty is the lack of information about the probability distribution of the value of the variables; and equivocality is confusion and lack of understanding about the environment itself (i.e., one does not know that the variable exists or one does not understand if it has any importance as an influence for the organization). For each dimension, three levels of low, medium, and high are assigned. Strategies are categorized using the modified Miles and Snow categories of prospector, analyzer with innovation, analyzer without innovation, defender, and reactor (Burton and Obel 1998, Miles and Snow 1978). Here, we use the Miles and Snow categories to describe the strategy only, not including the entire organization and the environment as Miles and Snow did. Those fit relationships are contained in the following misfit proposition.

ES1—*A low uncertainty environment is an extreme misfit with a prospector strategy.*

The low uncertainty is a fit with a defender strategy (Burton and Obel 1998, Miles and Snow 1978). A low-uncertainty environment can be predicted; the firm can plan, meet the competition, and realize efficiencies. The prospector is an innovator who projects into the environment with new ideas and products, but these ideas do not necessarily meet current and known needs. The prospector tends to be characterized by higher costs from innovation and is not focused on efficiency. The prospector strategy is high risk and can fail. Its market niche may emerge and evolve from its projection into the market (Miles and Snow 1978, pp. 56–58); some uncertainty yields this possibility.

ES2—*A highly equivocal environment is an extreme misfit for a defender strategy.*

ES3—*A highly equivocal environment is an extreme misfit for an analyzer without innovation.*

The poorly understood equivocal environment calls for a strategy that is not locked into fixed product and process alternatives. A highly equivocal environment calls for a prospector or analyzer with innovation to adjust (Burton and Obel 1998, Miles and Snow 1978). The defender and analyzer without innovation cannot adapt quickly and perform better in an environment in which good predictions can be made and realized—a low equivocality environment (Burton and Obel 1998, pp. 309).

ES4—*A low equivocality environment is an extreme misfit with a prospector strategy.*

ES5—*A low equivocality environment is an extreme misfit with an analyzer with innovation strategy.*
A low equivocality environment calls for a defender or analyzer without innovation strategy (Miles and Snow 1978, pp. 36–38, 72–73). The prospector and the analyzer with innovation need some opportunity for new ideas and new products to realize success. They cannot meet the efficiency and low cost demands that are needed with known competition (Burton and Obel 1998, pp. 310). The prospector and analyzer with innovation are not efficient and low cost providers, which is needed where competition is fierce in a low equivocal environment [i.e., low cost strategy (Porter 1985, pp. 12–14)].

**Technology-Environment.** Technologies vary in their adaptive capacity (Daft and Lengel 1986, Perrow 1967, Scott, 1992). We categorize organizational technologies into routine and nonroutine. A routine technology is well known and contains few exceptions, with easy-to-solve problems; a nonroutine technology has many exceptions and more difficult problems (Perrow 1967, p. 196). A routine technology is not adaptable and costly to change; a nonroutine technology is more adaptive to the requirements. Equivocality is confusion and lack of understanding about the environment. We propose two extreme misfits between the organization’s technology and the environment.

**TE1**—A routine technology is a misfit with a high equivocality environment.

A routine technology fits well with a low equivocality environment, because this environment is predictable, and a routine technology is sufficient to deal with the very limited change. Furthermore, it is more likely to be efficient and meet low cost requirements of competition (Burton and Obel 1998, Daft and Lengel, 1986). Now, the routine technology will not adapt quickly or easily, because the high equivocal environment demands as it changes; it is a misfit.

**TE2**—A non-routine technology is a misfit with a low equivocality environment.

For this next proposition, the misfit is the opposite extreme—nonroutine technology and low equivocality. Here, the nonroutine technology fits better with a higher equivocality, in which adaptation is required (Burton and Obel 1998, Daft and Lengel, 1986).

**Climate-Environment.** We apply the competing values approach to categorize climate into: internal process, group, rational goal, and developmental (Burton and Obel 1998, Zammuto and Krakower 1991). The internal process climate is a formalized and structured workplace; the group climate is a friendly and familiar place; the rational goal is a hard-driving and results-oriented climate; and the developmental climate is entrepreneurial and creative. The organizational climate is relatively enduring, influencing individual behavior and organizational outcomes (Glick 1985, p. 607). We include four climate environment misfits.

**CE1**—Group climate is a misfit with a high equivocality environment.

A group climate is tightly focused toward its own members, but is not focused on the environment and has high resistance to change; thus, it cannot change quickly as required by the high equivocality environment (Burton and Obel 1998, Hooijberg and Petrock 1993).

**CE2**—Internal process climate is a misfit with a high equivocality environment.

An internal process climate is focused on its rules of action and behavior and not on the organization’s environment. It has a high resistance to change and fits well with a low equivocality environment, in which requisite change is much less likely (Burton and Obel 1998, Hooijberg and Petrock 1993). It is a misfit with the high equivocality where change is demanded.

**CE3**—Developmental climate is a misfit with a low equivocality environment.

A developmental climate encourages experimentation, adaptability, and risk-taking; it has a broad range of potential behaviors. However, it is not likely to be very efficient, nor meet the competitive requirements of a low equivocality environment (Burton and Obel 1998, Hooijberg and Petrock 1993).

**CE4**—Developmental climate is a misfit with a low uncertainty environment.

Similarly, the developmental climate is a misfit with a low uncertainty environment that does not require adaptation (Burton and Obel 1998, Hooijberg and Petrock 1993). The inefficiencies of the developmental climate cannot be incurred in a low uncertainty environment.
Climate-Strategy. The strategy of an organization has to be aligned with views and feelings of those who implement it. Bluedorn and Lundgren (1993) incorporated the Miles and Snow strategy into the competing values context. As discussed previously, an internal process climate and a group climate are focused inwardly and are not very adaptive to the needs of a prospector or an analyzer with innovation strategy. In contrast, the developmental climate is too experimental for the efficiency focus of the defender strategy.

CS1—Internal process climate is a misfit with an analyzer with innovation strategy.

CS2—Internal process climate is a misfit with a prospector strategy.

The internal process climate is a rules-oriented inwardly focused climate; it is well suited for a defender strategy in which the focus on process is important (Bluedorn and Lundgren 1993, Burton and Obel 1998). The internal process climate does not change or adapt quickly, and it is not necessarily aligned with the organization’s strategy, particularly innovative strategies and prospectors (Bluedorn and Lundgren 1993, Miles and Snow 1978).

CS3—Group climate is a misfit with a prospector strategy.

The group climate reinforces its own values and ways of doing things; it is not very adaptive to external pressures (Burton and Obel 1998, pp. 312, 318). In contrast, the prospector strategy is an exploratory strategy that requires an organization to adjust quickly, thus there is a misfit (Bluedorn and Lundgren 1993, Miles and Snow 1978).

CS4—Developmental climate is a misfit with a defender strategy.

A developmental climate explores and has low resistance to change (Bluedorn and Lundgren 1993, Burton and Obel 1998). Here, there is a misfit between a climate, which has low resistance to change, and a strategy that has a low need for change, but a high need for efficiency (Burton and Obel 1998, Miles and Snow 1978).

Technology-Strategy. Strategy and technology do not fit together when one is quite adaptive and the other is not (Miles and Snow 1978).

TS1—Routine technology is a misfit with a prospector strategy.

A routine technology is not adaptive; a prospector strategy is both experimental and adaptive (Miles and Snow 1978, pp. 56–57). The two do not fit (Burton and Obel 1998, Miles and Snow 1978).

TS2—Nonroutine technology is a misfit with a defender strategy.

Similarly, a nonroutine technology and a defender strategy do not fit in the opposite way. The technology is adaptive, but the strategy is not (Burton and Obel 1998, Miles and Snow 1978).

Climate-Technology. There can be many issues to solve with technology.

CT1—An internal process climate is a misfit with a nonroutine technology.

The climate and technology do not fit when one is adaptive and the other is not. An internal process climate is rule-oriented and has high resistance to change; a nonroutine technology requires adaptation. Thus, there is a misfit (Burton and Obel 1998, Zammuto and O’Connor 1992).

CT2—A developmental climate is a misfit with a routine technology.

The nonroutine technology requires adaptation and change; it fits well with a developmental climate. The developmental climate can adapt and change, but the routine technology has a need for stability of process. Hence, there is a misfit (Burton and Obel 1998, Zammuto and O’Connor 1992).

Technology-Management Style. A nonroutine technology has many problems to solve and adaptations to make; each takes time. Management style is measured on six dimensions: Preference for delegation, level of detail in decision making, reactive or proactive decision making, time horizon, risk preference, and motivation/control. These six dimensions are mapped onto a microinvolvement measure, ranging from low to high (Burton and Obel 1998, pp. 92–95). A high microinvolvement management style involves management in the details; a low microinvolvement does not.

TM1—Nonroutine technology is a misfit with a management style with high microinvolvement, except in small organizations.
A nonroutine technology is adaptive and requires managerial involvement to realize change (Miller et al., 1982). With limited time to process all the information to manage a nonroutine technology, the high microinvolved managers will become overloaded and will not be able to make the needed decisions in a timely manner for the nonsmall organization—hence, a bottleneck (Burton and Obel 1998, p. 98). The high microinvolvement can work for a small organization in which there are few decisions.

Climate-Management Style. The management style can also be a misfit with the climate of the organization (Hunt 1991, p. 163). The management style should support the organizational climate.

CM1—Group climate is a misfit with a management style with high microinvolvement.

A group climate uses its own intragroup relations to manage itself and maintain its stability (Burton and Obel 1998, p. 125). Management does not need to be involved in details. The high microinvolvement management style can destroy the high morale, create conflict, and undermine management’s credibility. Hence, there is a misfit between group climate and high managerial microinvolvement (Burton and Obel 1998, DiPadova and Faerman 1993).

CM2—Developmental climate is a misfit with a management style with high microinvolvement.

Similarly, the developmental climate has its own internal momentum, and decisions are made widely and quickly. High microinvolvement by management can create a bottleneck. This misfit is a threat to both short-run operations, and to the climate itself (Burton and Obel 1998, DiPadova and Faerman 1993).

CM3—Internal process climate is a misfit with a management style with low microinvolvement.

CM4—Rational goal climate is a misfit with a management style with low microinvolvement.

The internal process climate has low trust, a high degree of conflict, and a high resistance to change (Burton and Obel 1998, p. 132). It requires a hands-on or high microinvolved management for a good fit. Similarly, the rational group climate with its low trust and high degree of conflict fits well with a high microinvolvement management. For both climates, the management’s low microinvolvement will permit the organization to drift in a dysfunctional manner, because the low trust and high conflict are likely to become worse. This creates a misfit (Burton and Obel 1998, DiPadova and Faerman 1993).

From the literature on fit and misfit, we argued previously that each one of the 24 extreme misfits listed lowers performance. Each misfit diminishes performance from what it could be (Donaldson 2001, p. 165). These 24 extreme misfit statements are combined into two overall misfit hypotheses: (1) Firms with misfits will experience a performance loss compared with firms without misfits, and (2) firms with a greater number of misfits will have greater loss of performance. Naman and Slevin (1993) used a misfit measure of the sum of absolute differences between desired levels and observed levels, indicating that more misfits are related to poorer performance. That is, misfits add up—more misfits further decrease performance (Nadler and Tushman 1984).

We are extending the individual propositions to a systems-level proposition about misfit overall. This is consistent with a systems model of organization in which fit is extended to the entire organizational properties, not only individual relations (Astley and Van de Ven 1983). The configurational model of fit posits that the whole of the organization must fit together or be in balance (Meyer et al. 1993). The multicontingency model (Figure 1) includes situational fit as necessary in the total-fit model. The two situational misfit hypotheses are:

Hypothesis 1. Firms with extreme situational misfits will have a significant loss in return on assets (ROA) compared with those firms with no extreme situational misfits.

Hypothesis 1a. Firms with a large number of extreme situational misfits will have a greater loss in ROA than firms with a few extreme situational misfits.

Contingency Misfits

Contingency fit is at the heart of contingency theory (Burns and Stalker 1961, Galbraith 1973, Galbraith 1995, Lawrence and Lorsch 1967, Miles and Snow 1978, Thompson 1967) and is fundamental to both multicontingency theory (Burton and Obel 1998) and configurational theory (Meyer et al. 1993). In Figure 1, the organizational relations include the situational factors of environment, strategy, technology,
size, management style, and climate. These variables are related to the appropriate organizational configuration, such as functional and divisional, as well as properties such as centralization, formalization, and organizational complexity. In this model, there is a hypothesized fit, congruency, or balance between the organization’s situation and its organizational design. For example, a highly uncertain environment fits with an organization with a low degree of formalization, but this environment is a misfit with a highly formalized organization. The formalized organization is likely to be too rigid without the ability to adapt to changes in the environment. We develop 66 extreme contingency misfits statements. Burton and Obel (1998) reviewed the literature that leads to the development of the extreme misfits presented later. Rather than present and discuss the contingency misfit statements one by one, we again group them into subsets for each situational factor and discuss them together.

Environment Misfits. A basic tenet in contingency theory is that there is a fit between the environment and the organization; the environmental imperative states that the environment helps determine a good choice for the organization’s structure (Burns and Stalker 1961, Duncan 1972, Lawrence and Lorsch 1967). As discussed previously, the environment is measured along three dimensions: Equivocality, uncertainty, and complexity, in which the description is multidimensional (Burton and Obel 1998, pp. 174–177). The organizational characteristics are centralization, formalization, complexity, and so on as shown in Figure 1. A given organizational structure fits well with one environment, but is a misfit with others. Here, we present environmental misfits for the organization.

An environment with a low equivocality, low complexity, and low uncertainty is a misfit with:

E1 Matrix configuration,
E2 Low formalization.

An environment that is low on all three dimensions of equivocality, complexity, and uncertainty is well understood; there are no unknown environmental properties. There is only a small number of important environmental parameters, and they are predictable. This environment fits well with an organization that operates smoothly and efficiently, in which everyone has a known, well-defined job (Burton and Obel 1998, pp. 182, 184–186). It is a misfit with an organization that has the capacity to deal with complex multidimensional issues in an informal and flexible manner. An informal organization is a misfit; its lack of procedure leads to lack of direction and costly inefficiency in this environment (Burns and Stalker 1961, Lawrence and Lorsch 1967, Lewin and Volberda 1999).

A matrix configuration with its multidimensional foci is a misfit.

An environment with a low equivocality, high complexity, and low uncertainty is a misfit with:

E3 Matrix configuration,
E4 Low formalization,
E5 Low organizational complexity.

Changing the environment from low to high complexity with low equivocality and low uncertainty requires a bureaucracy, albeit a complex one with many and complex rules. Formalization leads to efficiency (Burton and Obel 1998, pp. 182, 186). Here, again, a matrix configuration and low formalization are misfits. Low organizational complexity is also a misfit; from the law of requisite variety, the internal complexity must be at least as large as the environmental complexity (Ashby 1956). Thus, a low internal organizational complexity is a misfit for the high external environmental complexity (Burns and Stalker 1961, Lawrence and Lorsch 1967).

An environment with a low equivocality, high complexity, and high uncertainty is a misfit with:

E6 Simple configuration,
E7 Low organizational complexity,
E8 High centralization.

Here, the environmental uncertainty has changed from low to high, which suggests decentralization and high organizational complexity (Burton and Obel 1998, pp. 181, 186). A simple organization and/or an organization with high centralization have limited information-processing capacity at the top and cannot deal well with high uncertainty and high complexity (Burns and Stalker 1961, Lawrence and Lorsch 1967).
An environment with a high equivocality, low complexity, and low uncertainty is a misfit with:

E9 Functional configuration,
E10 High formalization.

High equivocality requires an organization that can adapt (Burton and Obel 1998, p. 187). Functional organizations and high formalization are efficient, but cannot change easily, as is required for high equivocality. The high equivocality is a misfit with a functional organization and high formalization (Burns and Stalker 1961, Lawrence and Lorsch 1967).

An environment with a high equivocality, low complexity, and high uncertainty is a misfit with:

E11 Functional configuration,
E12 High formalization,
E13 High centralization.

Building on the previous argument, the higher uncertainty makes the centralized decision making inefficient, because information bottlenecks will be created (Burns and Stalker 1961, Galbraith 1973, Lawrence and Lorsch 1967).

An environment with a high equivocality, high complexity, and high uncertainty is a misfit with:

E14 Functional configuration,
E15 High formalization,
E16 High centralization.

If the environmental uncertainty and complexity are at their highest, a complex, but informal organization is desired, which indicates an organic organization is required. A mechanical organization is a misfit (Burns and Stalker 1961, Burton and Obel 1998).

Strategy Misfits. The fit between structure and strategy builds on Chandler’s (1962) proposition, “structure follows strategy” (Naman and Slevin 1993). When the structure and the strategy are misaligned, then poor performance obtains. Here, the strategy misfits are grouped by the strategy: Prospector, analyzer with innovation, and analyzer without innovation and defender (Miles and Snow 1978).

A prospector strategy is a misfit with:

S1 Functional configuration,
S2 High formalization,
S3 High organizational complexity,
S4 High centralization.

A prospector strategy involves exploring new products and market opportunities. The very large information-processing demands on the organization can be met by a large number of individuals who can and will take action. Low formalization and low centralization are needed to move quickly (Miles and Snow 1978, pp. 61–64). A functional organization with its well-defined functions can be too narrow and limiting. High formalization narrows the possible responses of the organization and makes it poorly adaptable. High centralization will lead to a bottleneck for the requisite information-processing (Galbraith 1973). The prospector is then a misfit with the inflexible, centralized organization (Burton and Obel 1998, pp. 286–307).

An analyzer with innovation is a misfit with:

S5 Low organizational complexity.

An analyzer with innovation both searches for new opportunities and then moves on acceptable ones, and also keeps and maintains its existing business; it is a combined prospector and defender (Miles and Snow 1978, p. 68). This two-dimensional focus that is somewhat contradictory, requires organizational complexity to cope with this complex strategy (Ashby 1956). An organization with low complexity cannot cope with the possibilities (Burton and Obel 1998, pp. 286–307).

An analyzer without innovation is a misfit with:

S6 Low formalization,
S7 Low organizational complexity,
S8 Low centralization.

An analyzer without innovation is similar to a defender as it defends its existing business, but it also looks for new opportunities after others have demonstrated the business opportunity (Miles and Snow 1978, p. 68). It follows, but without innovation. There is little need for decentralization; the required coordination can suffer from multiple decision makers, and it can be costly. There is a focus on the efficiency of specialization and associated rules of formalization (Burton and Obel 1998, pp. 286–307).
A defender strategy is a misfit with:

- **S9** Matrix configuration,
- **S10** Low formalization,
- **S11** Low organizational complexity,
- **S12** Low centralization.

A defender strategy focuses on keeping what the organization has (Miles and Snow 1978, p. 31). It has a limited number of products for a narrow market with an emphasis on efficiency. There is little need for variety in action and organizations, which are complex and have a high information-processing capacity by introducing unneeded and unwanted potential variation. A matrix organization has excess information processing for the defender and is a misfit. Low formalization and low centralization introduce unwanted variety. A low organizational complexity is inefficient; greater efficiency can be obtained with a horizontal differentiation of tasks and the efficiency of specialization (Burton and Obel 1998, pp. 286–307).

**Technology Misfits.** The technology imperative that the organizational structure must fit with the technology grew from Woodward (1965) and Perrow (1967). Routineness and divisibility are technology dimensions. Routineness is the degree to which today’s activities are like yesterday’s, and divisibility is the degree to which the production process can be broken down into separable parts.

*A high routine technology is a misfit with:*

- **T1** Matrix configuration,
- **T2** Low formalization,
- **T3** Low complexity.

For a high routine technology, the organization does not require large information-processing capacity; recent history creates the plan. High formalization and high complexity are desired (Woodward 1965). The high information-processing capacities of a matrix configuration are not needed; they are costly and can lead to confusion. Low formalization and low complexity of low specialization can diminish the efficiency of routineness (Burton and Obel 1998, pp. 286–307).

A nonroutine technology is a misfit with:

- **T4** Functional configuration,
- **T5** High formalization,
- **T6** High complexity,
- **T7** High centralization.

The complementary argument for a nonroutine technology creates misfits for organizations that are limited in their information-processing capacity and are not adaptive to change. The functional organization, high formalization, high complexity, and high centralization limit the adaptive capacity of the organization and are misfits (Burton and Obel 1998, pp. 286–307).

*A highly divisible technology is a misfit with:*

- **T8** Matrix configuration.

High divisibility requires relatively small information-processing capacity from the organization. A functional organization is a good fit (Burton and Obel 1998; Woodward 1965). A matrix organization has excess capacity to process information and coordinate activities that do not require coordination.

*A nondivisible technology is a misfit with:*

- **T9** Divisional configuration.

Low divisibility of technology requires integration and high information-processing capacity (Burton and Obel 1998, p. 229). A divisional configuration creates autonomous subunits or divisions that cannot deal with technologies that are integrated across divisions, thus creating a misfit.

**Size Misfits.** Size misfits are grouped by large and small organizations. Size is measured by the number of employees, moderated by the skill level of the employees; higher skilled employees make the organization “larger” (Baligh et al. 1996, pp. 1658–1660).

*Thus, a large-sized organization is a misfit with:*

- **Si1** Simple configuration,
- **Si2** Low formalization,
- **Si3** Low complexity,
- **Si4** High centralization.

A large organization needs to be compartmentalized into smaller administrative units (Whetten and
Cameron 2002); otherwise, the top of the organization becomes overloaded and cannot make decisions, direct activities, and control the firm (Blau 1970). It is a misfit with a simple configuration or centralized decision making. Furthermore, the large organization benefits from specialization of tasks and formalized rules (Miller 1987). We suggest that a large organization creates misfits when management attempts to run the organization informally without specialization of tasks. Briefly, there is too much for management to do—information overload and decision gridlock can occur (Blau 1970, Burton and Obel 1998, Galbraith 1995).

A small-sized organization is a misfit with:

Si5 High formalization,
Si6 High complexity.

In contrast, a small organization does not need the specialization and horizontal differentiation of high complexity, nor the formalization as top management can make the decisions, and coordination can be informal rather than by the rules (Burton and Obel 1998, Whetten and Cameron 2002, pp. 158, 328–332).

Climate Misfits. An organization’s internal climate is a “relatively enduring quality” that is experienced by its members and affects their behavior, and can be described as characteristics (Tagiuri and Litwin 1968, p. 27). Zammuto and Krakower (1991) found seven dimensions of climate that yielded four organizational climate types using a competing values framework: Group, developmental, internal process, and rational goal.

A group climate is a misfit with:

C1 Functional configuration,
C2 High formalization,
C3 High complexity,
C4 High centralization.

For a group climate, which is characterized as a “friendly place to work where people share much of themselves,” low formalization, low centralization, nonhigh complexity, and group incentives work well (Burton and Obel 1998, pp. 125–126). The group itself wants to “run its own show” as determined by its own preferences and does not want to be constrained by internal rules and procedures, nor told what to do. It would also like to be independent of its environment to the extent possible. A group climate is a misfit with constraints on its choices and behavior, which are imposed by the organization, its assignment of tasks, and procedures. It is a misfit with an organizational structure that impinges on the members’ scope of action through high formalization, complexity, centralization, and the functional assignment of tasks (Zammuto and Krakower 1991, p. 95).

A developmental climate is a misfit with:

C5 Machine bureau,
C6 Functional configuration,
C7 High formalization,
C8 High complexity,
C9 High centralization.

A developmental climate is characterized as a “dynamic, entrepreneurial, and creative place to work” with high trust, low conflict, and a drive toward change (Burton and Obel 1998, pp. 127–128). It works well for people who want to take responsibility and can change as new opportunities emerge. It is a good fit with a matrix structure, low formalization, low–medium complexity, and low–medium centralization (Burton and Obel 1998, p. 129). The development climate is a misfit with very structured, specialized, and centralized organization tasks (Zammuto and Krakower 1991, p. 95).

An internal process climate is a misfit with:

C10 Simple configuration,
C11 Matrix configuration,
C12 Low formalization,
C13 Low complexity.

The internal process climate is described as a “formalized and structured place to work” with low trust and high degree of conflict, as well as a high degree of resistance to change (Burton and Obel 1998, p. 122). An internal process climate requires a very structured organization in which each person knows his/her job—a bureaucracy with high formalization and complexity (Burton and Obel 1998, p. 132). It is a misfit with a simple organization or matrix structure, low
formalization, and lack of procedural rules and general tasks of low specialization and low complexity (Zammuto and Krakower 1991, p. 95).

A rational goal climate is a misfit with:

C14 High formalization.

The rational goal climate is described as “results-oriented” with a drive for change, a low degree of trust, and a high degree of conflict (Burton and Obel 1998, p. 122). A rational goal climate requires the flexibility for change of low-to-medium formalization (Burton and Obel 1998, p. 135). It is a misfit with formalization that makes change more difficult and time-consuming (Zammuto and Krakower 1991, p. 95).

Management-Style Misfits. Management and leadership style capture the decision-making and attitudinal preferences of management and then categorizes management style into a high or low preference for microinvolvement. A high microinvolvement manager prefers not to delegate, gives specific directions, is reactive, focuses on the short-term, is risk-averse, and applies controls. A low microinvolvement manager prefers to delegate, gives general directions, is proactive, focuses on the long-term, can assume risk, and motivates through inspiration (Burton and Obel 1998, p. 98).

A high level of microinvolvement is a misfit with:

M1 Matrix configuration,
M2 Divisional configuration,
M3 Low formalization,
M4 Low centralization.

The matrix and divisional configurations involve others in decision making, as does low centralization and low formalization (Burton and Obel 1998, pp. 53–64). Thus, an organizational structure that allows for a more remote decision-making process does not fit with a manager with a preference for a high degree of microinvolvement who wants to be in charge and command the organization.

A low level of microinvolvement is a misfit with:

M5 Simple configuration,
M6 Functional configuration,
M7 High formalization,
M8 High centralization.

In contrast, a leader with a low preference for microinvolvement prefers an organization with a built-in capability to run itself and that adapts appropriately, given the overall decisions made by top management (Burton and Obel 1998, pp. 99–103). The simple configuration, the functional configuration, high centralization, and high formalization require deep involvement in the organization’s operations. Without this managerial involvement, the organization is without the required guidance and thus experiences a misfit.

As we argued for the situational misfits, these 66 extreme contingency misfits are combined into two overall contingency misfit hypotheses: (1) the collectivity of extreme contingency misfits is costly, (2) additional contingency misfits are even more costly. We extend the individual proposition to a systems level for the effect of misfits. In Figure 1, the multicontingency model requires contingency fit as a necessary condition; thus, the set of extreme contingency misfits will diminish performance, here measured by the decrease in the rate of return. This is a parallel argument to the earlier Hypotheses 1 and 1a on situational misfits. The two extreme contingency misfit hypotheses are given as:

HYPOTHESIS 2. Firms with extreme contingency misfits will have a significant loss in ROA, compared with those firms with no extreme contingency misfits.

HYPOTHESIS 2A. Firms with a large number of extreme contingency misfits will have a greater loss in ROA than firms with a few extreme contingency misfits.

We now combine situational and contingency misfits into an overall hypothesis. In Figure 1, the multicontingency model requires fit for both the situation and contingency relationships. Burton and Obel (1998) argue that, if the situational fit is not met, then contingency fit may not help. We also want to compare with the combined effect from the two types of misfits. This is more formally stated in the hypothesis below (p. 18):

HYPOTHESIS 3. Firms with extreme situational and extreme contingency misfits will have a significant loss in
Return on Assets Loss from Situational and Contingency Misfits

Data, Methodology, Analysis, and Results

Data

The data come from a study of small- and medium-sized production and service corporations (SMEs) located in the western part of Zealand, Funen, and the southern part of Jutland, Denmark. The companies are incorporated and have from 50 to 500 employees. For incorporated firms, financial data, industry code, and size are publicly available.

The data collection process consisted of telephone interviews with the total population of 433 firms in which some initial data were collected, and permissions were asked to send a questionnaire to the chief executive officer (CEO). Questionnaires were then sent to 365 firms. Two hundred and forty-six questionnaires were returned after one follow-up call was made to those companies that had not observed the return deadline. Of the 246 SME cases, four were omitted. Two of the companies had only filled out the front page of the questionnaire: one company was a daughter company of a company that was taken to court because of fraud, and one company was subsidized by a workers union such that the financial data could not be used. Nine cases contained only missing values on all variables used in the study, and they were removed. An additional nine companies with negative equity value were also excluded. Thus, 224 firms were studied. A response rate of 52% is satisfactory. A test for sample bias—relating to size, location, industry, ROA, and founding year—showed no significant bias.

Using the CEO as the informant, the data that are not publicly available represent the management’s view of the organization and its situation. This view is particularly relevant in SMEs because the CEO strongly influences the decision making in small- and medium-sized firms. Here, we follow the sampling strategy advocated by Seidler (1974) by using the same type of key informant in all the sampled organizations, thus holding the sample bias constant across the organizations. Before the questionnaire was sent out in spring 1997, it was pilot-tested in seven companies with an interviewer present while the respondent answered the questions. Based on this test, some of the questions were reformulated to avoid wording that might lead to misunderstandings. The questionnaire covers the dimensions in the Burton and Obel (1998) multidimensional contingency model (Figure 1). The actual questions and the mapping to the dimensions in the model are shown in the appendix. The constructs used in the questionnaire have been tested in the validation process of the OrgCon tool (Baligh et al. 1994). Additionally, most of the constructs have been used in other studies; details are given in the appendix.

As controls for construct validity, we applied two measures, \( R^2 \) and the Cronbach \( \alpha \). In case of a construct determined by a cluster analysis we report the overall \( R^2 \) for all variables in the analysis, as well as for each variable. For those constructs based on a simple sum of variables, we report the overall Cronbach \( \alpha \) for all variables. In the cases where the construct is the simple sum of more than two variables, we also report the Cronbach \( \alpha \) for each variable. These numbers are reported in the appendix in connection with the construct definitions. In general, the \( R^2 \) and \( \alpha \) values are above 0.60, which is acceptable. For the variable “management preference for decisions based on detailed information,” the \( \alpha \) value is 0.53. The \( \alpha \) values for the variable covering organizational complexity are only in the range (0.06–0.13). The organizational complexity construct covers the horizontal, vertical, and spatial differentiations, which, from a theoretical point of view, do not necessarily co-vary.

The data collection procedure, validation, and the data are described further in Eriksen and Døjbak (1998a, 1998b).1

Performance Data

Financial data for 1996 and 1997 were collected from public sources as they became available in 1998, 1999, and 2000. The performance measures in the study are: \( \text{ROA}_{96} = \frac{\text{PROFIT}_{96}}{\text{ASSETS}_{96}} \times 100\% \) and \( \text{ROA}_{97} = \frac{\text{PROFIT}_{97}}{\text{ASSETS}_{97}} \times 100\% \).

1 available from the authors.
we want to analyze the effect on intrafirm variation in the change in financial performance of organizational misfits, rather than the effect of organizational misfits on the interfirm variation in performance levels. This has the obvious benefit of adjusting for unobservable firm-specific effects on the level of performance. ROA is one of the most widely used profitability ratios in organizational and strategic analyses (Hax et al. 1984).

Methodology
To test the hypotheses, we used a linear regression model:

\[
\text{ROA}_{97} = \alpha + \delta \times \text{ROA}_{96} + \mathbf{M} \times \beta + \mathbf{K} \times \gamma + \mathbf{u},
\]

where ROA\(_{96}\) and ROA\(_{97}\) are \(n \times 1\) vectors of the observed values of ROA\(_{96}\) and ROA\(_{97}\) for the \(n\) firms; \(\mathbf{M}\) is an \(n \times k\) matrix of \(k\) design variables measuring misfit; \(\mathbf{K}\) is an \(n \times h\) matrix of \(h\) control variables holding firm and other characteristics that may influence performance as measured by ROA; \(\beta\) and \(\delta\) are \(k \times 1\) and \(h \times 1\) vectors of parameters measuring the degree of impact of \(\mathbf{M}\) and \(\mathbf{K}\) on ROA\(_{97}\); and \(\mathbf{u}\) is an \(n \times 1\) vector of random errors. \(\delta\) is a parameter reflecting the degree to which a certain ROA\(_{96}\) level is repeated in the ROA\(_{97}\) details. The inclusion of the lagged variable ROA\(_{96}\) among the regressors provides several advantages. “Using a lagged dependent variable in a cross-sectional equation increases the data requirement, but it also provides a simple way to account for historical factors that cause current differences in the dependent variable that are difficult to account for in other ways” (Wooldridge 2000). ROA\(_{96}\) instrumentalizes against bias from omitted control variables. This means that by adding ROA\(_{96}\) to the equation, we take into account factors that may have caused differences in ROA in the past. We will expect \(\delta\) to be positive to represent inertia. In the interpretation of our results \(\beta\) represents the effect of misfits for companies with identical historical ROA. Thus, \(\beta\) represents the effect of misfits for the period studied. In addition, we use growth in the number of employees from 1996 to 1997, \(\Delta\text{EMPL} = \text{EMPL}_{97} - \text{EMPL}_{96}\), as an explicit control variable. It is shown in former studies that organizational growth can be a strong determinant for improved performance (Capon et al. 1990).

We performed three regressions, analyzing: (1) situational misfits only, (2) contingency misfits only, and (3) situational and contingency misfits together. See Figure 2 for the relative structure of the models. In all three regressions, we used dummy variables to operationalize misfits. Our use of the particular dummy variables defined below allows us to test a complex model with a limited number of cases, in particular the interaction effects between the different types of misfits. The full specification of the model with each individual misfit as a dummy variable and a regular specification of the interaction variables would require many more case companies to obtain enough degrees of freedom in the statistical model.

In the regression models, the extreme misfit hypotheses were aggregated to test the stated hypotheses. The aggregation process is shown in Figure 2.

Model 1: Hypotheses 1 and 1a
For the situational misfit analysis, \(\mathbf{M}\) consists of the variables:

\[
\text{SITMISF} = 1 \text{ if any situational misfit is present, 0 otherwise; and}
\]

\[
\text{NO TECH-CLIM} = 1 \text{ if a situational misfit is present in any dimension, but not in technology/climate, 0 otherwise. Two technology-climate misfits are stated: Internal process climate is a misfit with a nonroutine technology (CT1), and a developmental climate is a misfit with a routine technology (CT2).}
\]

The nine additional variables—\(\text{NO STRAT-CLIM}, \text{NO MANA-CLIM}, \text{NO ENVI-CLIM}, \text{NO STRAT-ENVI}, \text{NO STRA-TECH}, \text{NO MANA-ENVI}, \text{NO MANA-STRAT}, \text{NO MANA-TECH}, \text{and NO TECH-ENVI}\)—are defined similarly covering the other types of extreme situational misfits statements.

The variable SITMISF measures the negative effect (if any) of situational misfit on performance, whereas the variables \(\text{NO TECH-CLIM}, \text{NO STRAT-CLIM}, \text{NO MANA-CLIM}, \text{NO ENVI-CLIM}, \text{NO STRA-ENVI}, \text{NO STRA-TECH}, \text{NO MANA-ENVI}, \text{NO MANA-STRAT}, \text{NO MANA-TECH}, \text{and NO TECH-ENVI}\) measure the positive (if any) effect of being without misfit in the technology climate, strategy climate, management climate, environment climate, strategy environment, strategy technology, management environment, management strategy, management technology, and technology environment dimensions, while still having at
least one other extreme situational misfit. Each of the dummy variables thus captures an aggregate measure of a particular type of misfit. But, it does not distinguish between the particular kind of misfit inside the group. For example, the dummy variable NO ENVI-CLIM will take the value 1 if the firm does not have any of the misfits CE1, CE2, CE3, or CE4, and it has at least one misfit. Additionally, if for a particular variable there is a missing value, this is treated as a fit; thus, a fit group may include some companies that actually have a misfit. This coding procedure allowed us a reasonable degree of freedom, and implies that the measure and tests are very conservative. The group of companies with no misfits may actually have a better performance increase than we were able to show.

Model 2: Hypotheses 2 and 2a
For the contingency misfit analysis, M consists of the variables:

\[ \text{CONTMISF} = 1 \text{ if any contingency misfit is present, } 0 \text{ otherwise}; \]

and

\[ \text{NO CONF} = 1 \text{ if contingency misfit is present, but not a misfit related to configuration.} \]

section, we stated the following 19 contingency misfit propositions related to configuration: E1, E3, E6, E9, E11, E14, S1, S9, T1, T4, T8, Si1, C1, C5, C6, C10, M1, M2, and M5.

NO FORM, NO COMP, and NO CENT are defined in a similar way with respect to the contingency misfits related to formalization, organizational complexity, and centralization. The variable CONTMISF measures the negative effect of contingency misfit on performance, whereas the variables NO CONF, NO FORM, NO COMP, and NO CENT measure the positive (if any) effect of being without misfit related to configuration, formalization, organizational complexity, and centralization, and still having at least one other extreme contingency misfit.

Model 3: Hypothesis 3
For the combined situational and contingency misfit analysis, M is made up by the variables:

\[ \text{MISFIT} = 1 \text{ if any misfit is present, } 0 \text{ otherwise; } \]

\[ \text{NO SIT} = 1 \text{ if only contingency misfit is present, } 0 \text{ otherwise}; \]

and

\[ \text{NO CONT} = 1 \text{ if only situational misfit is present, } 0 \text{ otherwise.} \]
The linearity assumption in (1) is tested using a Ramsay RESET test, performed as follows: Regress ROA\(_{97}\) on ROA\(_{96}\), \(M\), and a constant. Calculate the predicted value of ROA\(_{97}\), denoted by \(\hat{P}\). Calculate the squares and third degrees, \(P^2\) and \(P^3\). Regress ROA\(_{97}\) on ROA\(_{96}\), \(M\), a constant, and \(P^2\) and \(P^3\). If the F tests for \(H_0: P^2\) and \(P^3\) are jointly insignificant and not too high, the linearity assumption is adequate. Furthermore, we test for heteroscedasticity using a White W-test; regress the squared error on all squared explanatory variables, obtain the \(R^2\) value from this regression, and calculate \(W = n \times R^2\). \(W\) follows a \(\chi^2(p)\) distribution under \(H_0\); homoscedasticity, where \(p\) is the number of squared variables (Greene 2000). Finally, we report the condition index to provide a measure of eventual multicollinearity problems.

### Analysis of Situational Misfits: Hypotheses 1 and 1a

Of the 224 firms, 38 firms have no situational misfits; 51 firms have 1 situational misfit; 71 firms have 2 situational misfits; 46 firms have 3 situational misfits; 10 firms have 4 situational misfits; 6 firms have 5 situational misfits; 1 firm has 6 situational misfits; and 1 firm has 7 situational misfits.

Table 1 shows the regression results for the analysis of the effect on performance of situational misfits. We expect the coefficient for SITMISF to be negative, reflecting that firms with situational misfits have lower performance (Hypothesis 1). The results show that this is indeed the case at the 5% level. The coefficients for NO TECH-CLIM, NO STRAT-CLIM, NO MANA-CLIM, NO ENVI-CLIM, NO STRA-ENVI, NO STRA-TECH, NO MANA-ENVI, NO MANA-STR, NO MANA-TECH, and NO TECH-ENVI are expected to be zero, (Hypothesis 1a). If, on the other hand, there are any benefits from the absence of misfit in a single dimension, then the coefficient for the respective variable should be significantly positive. The coefficients for technology-climate misfits, strategy-environment misfits, as well as for management-environment misfits are all significantly different from zero at the 10% level. There are no significant effects of absence of the other situational misfits. It is also seen that the coefficients related to ROA\(_{96}\) and \(\Delta EMP\) are significantly different from zero at the 5% and 1% levels, respectively. The coefficient for ROA\(_{96}\) is 0.56, which shows that the inertia effect is medium. We also ran the model without the ROA\(_{96}\) variable. In this case, there was no significant effect of the situational misfits. This indicates that it is important to control for nonobservable, firm-specific factors.

The Ramsay RESET test suggests adequacy of the linearity assumption. Some, but not an alarming amount of heteroscedasticity is indicated by the White-W test. The condition indices are not very high, thus indicating a sufficiently low degree of collinearity among the regressors. The \(R^2\) is approximately 0.4 in all models, which is satisfactory. Thus, these results provide strong support for Hypothesis 1, but provide inconclusive support for Hypothesis 1a.

### Analysis of Contingency Misfits: Hypotheses 2 and 2a

Of the 224 firms, 32 firms have no contingency misfits; 105 firms have one contingency misfit; 62 firms have 2 contingency misfits; 24 firms have 3 contingency misfits; and 1 firm has 4 contingency misfits. Table 2 presents the regression results for contingency misfits.
We expect the coefficient for CONTMISF to be negative, reflecting that firms with contingency misfits have lower performance (Hypothesis 2). The coefficients for NO CONF, NO FORM, NO COMP, and NO CENT are expected to be zero (Hypothesis 2a). If, on the other hand, there are any benefits from the absence of misfits in a single dimension, then the coefficient for the respective variable should be significantly positive. They are not.

Firms with contingency misfits have a significantly lower ROA97 than firms with no contingency misfits. Because the results do not give any significant NO CONF, NO FORM, NO COMP, and NO CENT, a conclusion that fewer misfits may increase performance is not supported (Hypothesis 2a). Again, the coefficients for the control variables are significantly different from zero and with almost the same numerical values as before. Again, we ran the model without the ROA96 variable. In this case, there were no significant effects of the contingency misfits.

The Ramsey RESET test suggests adequacy of the linearity assumption. Some, but not an alarming amount of heteroscedasticity is indicated by the White-W test. The condition indices are not very high, thus indicating a sufficiently low degree of collinearity among the regressors. The $R^2$ is above 0.4, which is satisfactory. These results provide strong support for Hypothesis 2, but no statistically significant support for Hypotheses 2a.

### Analysis of Contingency Misfit Conditioned on Situational Fit-Misfit: Hypothesis 3

Of the 224 firms, 168 firms have both situational and contingency misfits; 18 have only one or more situational misfits; 24 have only one or more contingency misfits; and 14 have no misfits at all.

Table 3 presents the regression results on the combined model. We expect the coefficient for MISFIT in Table 3 to be negative, reflecting that firms with situational and/or contingency misfits have lower performance. The coefficients for ONLY CONT and ONLY SIT are expected to be zero. If, on the other hand, there are any benefits from the absence of either contingency or situational misfit, then the coefficient for the respective variable should be significantly positive. In this model, we also tried to exclude the ROA96 variable with the effect again that there was no significant effect of the MISFIT variable. Thus, in all models, it is important to control for nonobservable, firm-specific factors.

Table 3 shows that the MISFIT variable is negative and significantly different from zero, whereas the coefficients related to no situational and contingency misfits are not significantly different from zero. The coefficients related to the control variables are again significantly different from zero, with the same numerical values as in models 1 and 2.

Some, but not an alarming amount of heteroscedasticity is indicated by the W-test. The condition indices are not alarmingly high, thus indicating a sufficiently low degree of collinearity among the regressors. The $R^2$ is above 0.4, which is satisfactory.
The aforementioned results strongly support Hypothesis 3. Our study does not allow us to conclude on the effects of a particular misfit (e.g., which of the misfits might have a particular effect, if any).

**Limitations**

The complexity of our multidimensional model allows us to analyze an extensive set of extreme misfits. However, it also forces us to develop an aggregation procedure as shown in Figure 2, in which we lose the ability to investigate the effect of the individual misfit statements within the subset of misfit statements. For example, we investigate the effect of environmental misfits, but not the individual extreme misfit statements that make up the set of environmental misfits.

The sampling technique holds one set of potential biases constant—the same key informant is surveyed in all companies. The data, on the other hand, represent the views of a special group—the CEOs who are key decision makers for determining the organizational design. Their understanding of the organizational situation has a major effect for organizational design. The organizational climate, which represents the psychological attributes of the employees may be less understood by the CEO than other factors, but the CEO makes organizational design decisions based on his or her understanding of the organizational climate. Our results show that, if there are no extreme misfits in the data obtained from the CEO, the organization actually performs better than those companies in which the data represented one or more extreme misfits.

With the complex model and its many dimensions, many of the companies in the sample did not answer one or two of the questions, but did answer all the others. Given our approach, the questions that were unanswered could not create a misfit. The effect is that there may be more misfits than we measured, thus making our results conservative.

**Discussion**

We find that misfits matter; firms with no misfits obtain significantly better performance (Table 3) than firms with misfits—Hypothesis 1 and 2. Furthermore, we hypothesized that firms with more misfits would experience greater performance loss—Hypothesis 1a and 2a. We did not confirm these later hypotheses. Rather, we found only partial and inconclusive support that more situational misfits diminish performance (Table 1) and no significant support that more contingency misfits diminish performance (Table 2). This is an unanticipated result and a surprising one. Additionally, we found that it did not matter if the firm had situational misfits, contingency misfits, or both (Table 3)—Hypothesis 3. Thus, the main result of this study is that firms with no misfit at all seem to do better than those firms with any misfit. Furthermore, neither the type of misfit nor the number of misfits seem to matter.

One possible explanation for the unanticipated result comes from complexity theory, in particular an interpretation based on the Kaufmann (1993) NK model of complexity, where \( N \) is the number of elements in the system and \( K \) is the number of connections. Earlier, Simon (1962) defined a system in terms of the number of elements, \( N \), and the connections among them, \( K \). Systems theory and its interpretation for organizational theory indicates that \( N \) is large and that there are many connections, or \( K \) is also large (Astley and Van de Ven 1983). For our model, \( N \) is the number of misfit rules, and \( K \) is the number operative for any given firm. \( N \) is 90 (24 + 66) misfit propositions, and then \( K \) is the number of operative misfit propositions for a given firm. If there are no misfits, then \( K = 0 \). For a firm with one misfit, \( K = 1 \), and so on.

Levinthal (1997) and Rivkin (2000), among others, investigated the implications of complexity theory for organizations using computational NK models. Levinthal (1997) found that a firm that is tightly coupled (i.e., \( K \) is large) finds adaptation to environmental change difficult. For our model, a firm with misfits, \( K > 0 \), would find it difficult to identify a combination of operating solutions that yield good performance. Rivkin (2000) found that an organization that attempts to imitate the strategy of another organization is not likely to succeed—“the sheer complexity of a strategy can raise a barrier to imitation” (p. 825). A strategy of \( N \) elements with \( K \) connections is difficult to duplicate, and small deviations are likely to
lead to inferior results. That is, the imitation must be “perfect,” which is quite unlikely for large $N$ and large $K$. Kaufman found that, as $K$ increases for a given $N$ value, the system becomes difficult to optimize and he found further that small changes in one element can cause serious losses in the performance of the whole system. In brief, the system is nonlinear; the performance landscape is rugged. A rugged landscape has many peaks or local optima, and the relation among the peaks is not well defined, making it difficult to move from one local optimum to a better one. Alexander (1964) anticipated complexity theory and its $NK$ relations. He (pp. 38–41) presented the design problem as fit–misfit of form and context. (pp. 38–41). He then considered the relationship of the numbers of design variables, $N$, and their interconnections, $K$. For few interconnections, or $K$ low, the design problem can be solved quickly in comparison with $K$ large, in which the difficulty and time increase nonlinearly. Furthermore, he illustrates the ruggedness property, in which a single misfit makes the whole design unbalanced. That is, a single misfit may make the whole design unacceptable.

Complexity theory brings new insight into the nature of the organization, namely that it is difficult to optimize when $K > 0$, and that a good solution or design is subject to minor variations in specific variables. It is this nonlinearity or ruggedness of the solution landscape that is new for organizational studies (Levinthal 1997). The implication is that a small variation from a good design can lead, and is likely to lead to a large deterioration in performance. Small marginal changes can lead to large consequences; furthermore, small marginally rational changes in the design may or may not lead to improved performance, and may lead to large deterioration in performance. Our empirical results are consistent with the complexity results. A lack of misfit or total-fit solution is a good design and leads to increased performance; but small deviations, or any misfits, $K > 0$, lead to significant loss in performance. It is the presence of any misfit, and not the number of misfits that leads to loss of performance. We did not find any conclusive difference in performance loss as the number of misfits increases.

Conclusions

Fit in organizational contingency theory has a long tradition (Donaldson 2001). Misfit is defined as a condition that leads to diminished performance; yet, it is less well developed in terms of operational statements and empirical tests. In this paper, we extend fit relations to develop and state 24 situational misfit propositions and 66 contingency misfit propositions. We then aggregate the propositions into three overall hypotheses: The set of situational misfits diminishes the growth in ROA; the set of contingency misfits diminishes the growth in ROA; and the situational and contingency misfits together diminish growth in ROA.

This paper builds on Galbraith’s (1973; 1995) star model, Miles and Snow’s (1978) strategic-fit model, Mintzberg’s (1979) structuring model, Nadler and Tushman’s (1984) congruence model, Miller’s (1987) environment, strategy and structure model, Meyer et al.’s (1993) configurational model, Gresov’s (1989) structural misfit model, Naman and Slevin’s (1993) strategy misfit model, and Donaldson’s (2001) statement of organizational contingency theory. A comprehensive misfit model is developed and tested using regression models on 224 small- and medium-sized Danish firms. The results are both confirming and surprising. We find that situational, contingency, and the combination of proposed misfits do diminish performance, as hypothesized. Surprisingly, we could not conclude that additional misfits further diminish performance. We look to complexity theory and the idea of a rugged landscape for aid in interpretations. Namely, any misfit significantly diminishes performance in a nonlinear fashion. Or, more intuitively, a lack of any misfits leads to significantly better performance.

Future research can follow a number of directions. A misfit model of organizational design should be more fully articulated and tested for robustness. The surprising result that additional misfits affect performance in a nonlinear manner needs verification; the implications of complexity theory for organizational design should be explored further. We tested the model on 224 small- and medium-sized Danish firms; the misfit model needs additional empirical testing, both in its totality as tested here, but also in
smaller pieces. This is a long agenda to more fully develop the concept, the test, and operationalization of a model of organizational misfit.

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Appendix: Measuring Situation and Organizational Variables
This section describes the operationalization of the data collected in this study. The data are based in the multidimensional contingency model in Burton and Obel (1998) and use the variable definitions in their model. There are two main dimensions in the model: The situation and the organization.

The Situation
The situation is described by six overall variables: management style, organizational climate, size/ownership, environment, technology, and strategy. Each of these variables may then be defined by subvariables:

MANAGEMENT STYLE (1 = low microinvolvement; 2 = medium microinvolvement; 3 = high microinvolvement).
ORGANIZATIONAL CLIMATE (1 = group; 2 = development; 3 = internal process; 4 = rational goal).
SIZE (1 = small; 2 = medium with less impact; 3 = medium; 4 = large with less impact; 5 = large).
ENVIRONMENT:
ENVIRONMENT COMPLEXITY (1 = low; 2 = medium; 3 = high).
ENVIRONMENT UNCERTAINTY (1 = low; 2 = medium; 3 = high).
ENVIRONMENT EQUIVOCALITY (1 = low; 2 = medium; 3 = high).
TECNOLOGY:
TECHNOLOGY DIVISIBILITY (1 = high; 2 = medium, 3 = low).
TECHNOLOGY ROUTINE (1 = low; 2 = medium, 3 = high).
STRATEGY (1 = Prospector; 2 = Analyzer with innovation, 3 = Analyzer without innovation, 4 = Defender, 5 = Reactor).

Organization
The organization is described by the four classical variables:
CONFIGURATION (1 = simple; 2 = functional; 3 = divisional; 4 = project; 5 = matrix).
COMPLEXITY (1 = low; 2 = medium; 3 = high).
FORMALIZATION (1 = low; 2 = medium; 3 = high).
CENTRALIZATION (1 = low; 2 = medium; 3 = high).

The Questionnaire and the Relationships to the Variables
MANAGEMENT STYLE: Degree of management preference for microinvolvement: Formed from the variable MP = MP1 + MP2 + MP3 + MP4 + MP5 + MP6 [Cronbach alpha for MP1… MP6 = 0.69] and based on the concept of microinvolvement developed in Burton and Obel (1998).

(MP ≤ [33% percentile of MP] ⇒ 1; [33% percentile of MP] < MP ≤ [66% percentile of MP] ⇒ 2; [66% percentile of MP < MP] ⇒ 3), where

MP1: Management preference for strategic decisions: “Who makes strategic decisions” (CEO alone/CEO after discussion with leader group ⇒ 3; leader group after discussion with CEO ⇒ 2; leader group with confirmation from CEO/leader group without confirmation from CEO ⇒ 1) (α = 0.67).

MP2: Management preference for long-term decisions (α = 0.72): Defined from MP2a = (A1 + A2 + A3 + A4 + A5 + A6 + A7 + A8)/8 [Cronbach α for A1… A8 = 0.82]:

(MP2a < 1.5 ⇒ 1; 1.5 ≤ MP2a < 2.5 ⇒ 2; 2.5 ≤ MP2a ⇒ 3), where

A1: Solution of human problems/conflicts (without importance/less important ⇒ 1; important ⇒ 2; very important/extremely important ⇒ 3) (α = 0.81).

A2: Stimulate cooperation among divisions (without importance/less important ⇒ 3; important ⇒ 2; very important/extremely important ⇒ 1) (α = 0.80).

A3: Formulate ideas/visions (without importance/less important ⇒ 3; important ⇒ 2; very important/extremely important ⇒ 1) (α = 0.81).

A4: Guide employees from day-to-day (without importance/less important ⇒ 1; important ⇒ 2; very important/extremely important ⇒ 3) (α = 0.80).

A5: Develop/implement new routines and methods (without importance/less important ⇒ 3; important ⇒ 2; very important/extremely important ⇒ 1) (α = 0.80).

A6: Govern economic decisions/control accounts and budgets (without importance/less important ⇒ 1; important ⇒ 2; very important/extremely important ⇒ 3) (α = 0.80).

A7: Ensure that rules and procedures are followed (without importance/less important ⇒ 1; important ⇒ 2; very important/extremely important ⇒ 3) (α = 0.80).

A8: Ensure reasonable use of resources (without importance/less important ⇒ 1; important ⇒ 2; very important/extremely important ⇒ 3) (α = 0.80).

MP3: Management preference for decisions based on detailed information (never/seldom ⇒ 1; sometimes ⇒ 2; often/always ⇒ 3) (α = 0.53).

MP4: Management prefers to wait and see before action, if changes occur on the company’s markets (never/seldom ⇒ 3; sometimes ⇒ 2; often/always ⇒ 1) (α = 0.60).

MP5: Management preference for minimizing business risk (low ⇒ 1; medium ⇒ 2; high ⇒ 3) (α = 0.69).

MP6: Management preference for motivation of employees through control (opposed to inspiration): Based on MP6 = (B1 + B2 +
B3 + B4 + B5 + B6)/6 (α = 0.73) [Cronbach α for B1…B6 = 0.70]:
MP6 < 1.5 ⇒ 1; 1.5 ≤ MP6 < 2.5 ⇒ 2; 2.5 ≤ MP6 ⇒ 3), where

B1: “Management controls whether leading employees follow company rules” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (α = 0.67).

B2: “Management controls whether nonleading employees follow company rules” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (α = 0.66).

B3: “Management controls whether leading employees reach the expected results” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (α = 0.68).

B4: “Management controls whether nonleading employees reach the expected results” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (α = 0.65).

B5: “Management uses result-based salaries and the like to motivate leading employees” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (α = 0.70).

B6: “Management uses result-based salaries and the like to motivate nonleading employees” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (α = 0.70).

ORGANIZATIONAL CLIMATE: Developed as a 4-means non-hierarchical cluster solution, based on 7 questions, denoted as CLIMA1-CLIMA7 (R² = 0.47). As seeds for the 4 clusters, we used the mean values from a 4-group centroid-linkage hierarchical cluster solution. The climate construct is based on the competing values concept of Quinn and Rohrbaugh (1983). The questions are derived from Zammito and Krackover (1991).

CLIMA1: Level of trust: “Our employees can always trust each other” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (R² = 0.30).

CLIMA2: Level of conflict: “There are large disagreements among the involved employees when decisions are made” (never/seldom ⇒ 1; sometimes ⇒ 2; often/always ⇒ 3) (R² = 0.27).

CLIMA3: Employee morale: “Our employees have a high working morale” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (R² = 0.27).

CLIMA4: Rewards equity: “Employees find that rewards for their efforts are given in an equitable way” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (R² = 0.54).

CLIMA5: Resistance to change: “It is often difficult to make organizational changes” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (R² = 0.77).

CLIMA6: Leadership credibility: “The employees consider the leadership to be credible” (totally/partly disagreement ⇒ 3; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 1) (R² = 0.28).

CLIMA7: Level of scapegoating: “Employees are expected to take responsibility, also when something goes wrong” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3) (R² = 0.21).

SIZE = SIZE1 + COMP1, where SIZE1 = number of employees. (SIZE ≤ 100 ⇒ 1; 100 < SIZE ≤ 500 ⇒ 2; 500 < SIZE ≤ 1,000 ⇒ 3; 1,000 < SIZE ≤ 2,000 ⇒ 4; 2,000 < SIZE ⇒ 5). COMP1 is defined later. The size measure is the concept developed in Baligh et al. (1996) and Burton and Obel (1998).

Ownership is not used in the models, because all the firms are corporations.

ENVIRONMENT is measured using the three dimensions below:

ENVIRONMENT COMPLEXITY: “It is necessary to watch many conditions in the environment” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 3).

ENVIRONMENT UNCERTAINTY: EU = (C1 + C2 + C3)/3 [Cronbach α = 0.83; EU < 2.5 ⇒ 1; 2.5 < EU < 3.5 ⇒ 2; 3.5 < EU ⇒ 3), where

C1: “We can to a high degree predict the development in our environment” (totally/partly disagreement ⇒ 3; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 1) (α = 0.88).

C2: “Our environment only changes marginally” (totally/partly disagreement ⇒ 3; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 1) (α = 0.78).

C3: “Our environment only changes slowly” (totally/partly disagreement ⇒ 3; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 1) (α = 0.74).

ENVIRONMENT EQUIVOCALITY: “We know what to watch in our environment” (totally/partly disagreement ⇒ 3; neither disagreement nor agreement ⇒ 2; partly/totaly agreement ⇒ 1).

TECHNOLOGY is measured using two dimensions primarily based on Perrow (1967).

TECH-DIV: TECHNOLOGY DIVISIBILITY: “The production process is difficult to separate into independent tasks” (totally/partly disagreement ⇒ 1, neither disagreement nor agreement ⇒ 2, partly/totaly agreement ⇒ 3).

TECH-ROU: TECHNOLOGY ROUTINE: “The production process consists primarily of routine tasks” (totally/partly disagreement ⇒ 1, neither disagreement nor agreement ⇒ 2, partly/totaly agreement ⇒ 3).

STRATEGY: Developed as a 5-means nonhierarchical cluster analysis based on 5 questions, denoted STRAT1-STRAT5 (R² = 0.40). As seeds for the 5 clusters, we used the mean values from a 5-group centroid-linkage hierarchical cluster solution. The clusters are then mapped into five Miles and Snow categories as described previously. The mapping follows the mapping in Burton and Obel (1998).

STRAT1: Capital requirement (CR = assets/employees) (CR ≤ [33% percentile of CR] ⇒ 1; [33% percentile of CR < CR ≤ [56% percentile of CR] ⇒ 2; [66% percentile of CR < CR] ⇒ 3) (R² = 0.71), where
STRAT2: Product innovation: “We give higher priority to product innovation than our competitors” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totally agreement ⇒ 3) ($R^2 = 0.53$).

STRAT3: Knowledge of production methods: “We give high priority to a good knowledge of the recent production methods in our branch (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totally agreement ⇒ 3) ($R^2 = 0.27$).

STRAT4: Concern for quality: “We have a good reputation among our customers” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totally agreement ⇒ 3) ($R^2 = 0.28$).

STRAT5: Price level: “Our products have better price/quality relation than our competitors” (totally/partly disagreement ⇒ 1; neither disagreement nor agreement ⇒ 2; partly/totally agreement ⇒ 3) ($R^2 = 0.35$).

CONFIGURATION: As defined previously following the Mintzberg categories: The measurement of Complexity, Formalization, and Centralization were derived from Tables 3-1, 4-1, and 5-1 in Robbins (1983) and are based on Hage and Aiken (1967) and Hall et al. (1967).

COMPLEXITY: Degree of complexity: Defined from CP = COMP1 + COMP2 ($\alpha$ for COMP1, COMP2 = 0.08): $CP \leq 4 \Rightarrow 1; 4 < CP \leq 6 \Rightarrow 2; 6 < CP \Rightarrow 3$, where COMP1: employee degree of specialized training; Calculated as $(D1 + D2 + D3)/3$ ($\alpha$ for D1…D3 = 0.26), where

D1: “Leading employees have many years of experience in their field” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5) ($\alpha = 0.13$).

D2: “Our leading employees especially have higher education” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5) ($\alpha = 0.45$).

D3: “Our nonleading employees have many years of experience in their field” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5) ($\alpha = 0.06$).

COMP2: Degree of vertical levels of separation of CEO from employees at lowest level (1–2 levels ⇒ 1; 3–5 levels ⇒ 2; 6–8 levels ⇒ 3; 9–12 levels ⇒ 4; more than 12 levels ⇒ 5).

FORMALIZATION: Degree of formalization: Calculated from $FORM = FORM1 + \cdots + FORM6$ ($\alpha$ for FORM1…FORM6 = 0.70): $FORM < 15 \Rightarrow 1; 15 < FORM \leq 21 \Rightarrow 2; 21 < FORM \Rightarrow 3$, where

FORM1: “There are clear-cut rules for how leading employees must perform their jobs” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5) ($\alpha = 0.67$).

FORM2: Degree of supervision of employees to ensure compliance with standards set in job description: Calculated as ($\alpha = 0.67$) $(E1 + E2)/2$ ($\alpha$ for E1, E2 = 0.65), where

E1: “We carefully control whether our leading employees follow the rules of the company” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5).

E2: “We carefully control whether our nonleading employees follow the rules of the company” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5).

FORM3: Degree of latitude allowed to employees from these standards: Calculated as ($\alpha = 0.64$) $(F1 + F2)/2$ ($\alpha$ for F1, F2 = 0.39), where

F1: “Leading employees are allowed to deviate from the rules” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 1).

F2: “Nonleading employees are allowed to deviate from rules” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 1).

FORM4: “Nonleading employees’ work is to a high degree governed by standards” (totally disagreement ⇒ 1; partly disagreement ⇒ 2; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 4; fully agreement ⇒ 5) ($\alpha = 0.64$).

FORM5: “Nonleading employees are allowed to deviate from standards” (totally disagreement ⇒ 1; partly disagreement ⇒ 4; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 2; fully agreement ⇒ 1) ($\alpha = 0.67$).

FORM6: “Leading employees are allowed to deviate from standards” (totally disagreement ⇒ 1; partly disagreement ⇒ 4; neither disagreement nor agreement ⇒ 3; partly agreement ⇒ 2; fully agreement ⇒ 1) ($\alpha = 0.63$).

CENTRALIZATION: Degree of centralization: Based on CENT = CENT1 + ⋯ + CENT10 ($\alpha$ for CENT1…CENT10 = 0.83): $CENT \leq 20 ⇒ 1; 20 < CENT \leq 40 ⇒ 2; 40 < CENT ⇒ 3$, where

CENT1: “Management involved in collection of information used as base for decisions” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 5) ($\alpha = 0.81$).

CENT2: “Management involved in interpretation of information used as base for decisions” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 5) ($\alpha = 0.82$).

CENT3: “Management controls that decisions are realized” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 5) ($\alpha = 0.83$).

CENT4: “Leading employees have large influence on decision-making” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 5) ($\alpha = 0.80$).

CENT5: “Leading employees have large influence on decision-making” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 1) ($\alpha = 0.80$).

CENT6: “Leading employees have large influence on hire/fire of employees in their department” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 1) ($\alpha = 0.80$).

CENT7: “Leading employees have large influence on wage increases and promotions in their department” (never ⇒ 1; seldom ⇒ 2; sometimes ⇒ 3; often ⇒ 4; always ⇒ 1) ($\alpha = 0.80$).
CENT8: “Leading employees have large influence over purchasing of equipment and supplies” (never ⇒ 5; seldom ⇒ 4; sometimes ⇒ 3; often ⇒ 2; always ⇒ 1) (α = 0.80).

CENT9: “Leading employees often take their own initiatives” (never ⇒ 5; seldom ⇒ 4; sometimes ⇒ 3; often ⇒ 2; always ⇒ 1) (α = 0.82).

CENT10: “Leading employees are allowed to deviate from the rules” (never ⇒ 5; seldom ⇒ 4; sometimes ⇒ 3; often ⇒ 2; always ⇒ 1) (α = 0.83).

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